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ABSTRACT

This paper discusses phonological processes which assign ultimate phonetic realizations to function words. Stress patterns of function words are studied along with phonetic variation between strong and weak forms. The Auxiliary Reduction Rule is extended to account for the phonetic variation. (Author/AM)

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Phonology of Some Function Words in English*

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0. In the following chapters phonological processes will be discussed which assign ultimate phonetic realizations to function words such as determiners, prepositions, auxiliaries and a complementizer. Every function word is marked as to the lexical feature [M]. A word with [+M], but not the one with [-M], will undergo subsequent operations of stress weakening. The stress pattern of each formative is a given; its stress pattern at a phrase level is (partially) dependent on its grammatical context rather than its phonological context. The Auxiliary Reduction Rule (henceforth ARR), the only relevant stress weakening rule with function words, must be extended in such a way as to explain this dependence on grammatical context. Two possible formulations are in order: the one with grammatical categories indicated in the following context and the one without any. Since they predict different linguistic facts, the choice of one over the other should be carefully examined. Tested with a few crucial examples the labelled formulation of ARR seems to be stronger in its predictable power than the label-less formulation.

The data which will be examined in the following are limited to the Received Pronunciation of British English, but the data of other dialects of either British or American English will be explained in the same way.

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1. At the outset let us consider whether it is necessary to set up stress assignment rules which are applicable to function words as well as nouns, verbs and adjectives. One may speculate that function words need not be assigned any degree of stress at any step of derivation since, unlike content words, they never occupy stress peaks in an utterance. Such a speculation, however, will easily turn out to be false for two reasons. First there exists a sonority peak in a multi-syllabic function word. To take a preposition about as an example, the prominent syllable falls on the second but not the first. Second, even a monosyllabic function word is given a stress in some contexts. It may even take a sentence stress which is distinct from emphatic or contrastive stress. Let us observe the following examples. (The marks ˊ and ˘ stand for a stressed syllable and an unstressed syllable, respectively.)

(1) a. I'd like s˘ome tea.

b. I'd like sóme.

(2) a. It's f˘or making the cake rise.

b. What's the powder fór?

(3) a. You m˘ust leave soon.

b. I suppose you múst.

Function words in (1b), (2b) and (3b) each receive some degree of stress, with sentence stress on some and must, while the ones in (1a), (2a) and (3a) lose stress. The existence of sentences such as in the b-series above will

give a firm ground for setting up stress assignment rules applicable to function words. The nature of these rules, however, is not known at present and the clarification of it is beyond the scope of this paper. Then let us take the following hypothesis as a basis for examining the stress of function words.

(4) Hypothesis I: Any function word is given one stress peak by extended versions of the Main Stress Rule.

How will the stress pattern of a function word be modified when it enters a larger cycle? Observe the stress patterns of the determiners below.

(5) a. ă bottle

b. óne bottle

(6) a. hĕr book

b. Jóan's book

While one and Joan's above have secondary stress at the Noun Phrase cycle, a and her have no stress, which can be ascertained by the presence of the vowel [ə] which occurs only in unstressed positions. The next question will be what makes the syntactically identical classes phonologically distinct as we have just observed above. No doubt it is due to different derivational processes. In case of the b-series, after the Main Stress Rule has been operated on a determiner and a noun, the Nuclear Stress Rule is applied to the NP cycle. On the other hand, with (5a) and (6a), a stress reduction rule seems to have been responsible for the drastic stress weakening on the

determiners. By the introduction of an extra rule it became possible to change the secondary-primary stress contour of the noun phrase into minus(i. e. weak)-primary. The applicability of the ARR is a lexical feature of individual items.

Prepositions and auxiliaries are each divided into two major classes; those which undergo the operation of the ARR as in (7a) and (8a), and those which do not as in (7b) and (8b).

(7) a. Let's meet ăt seven.

b. Let's meet áfter seven.

(8) a. You mŭst not move.

b. You néed not move.

Following is a list of some typical function words which will be dealt with in the following sections.[1] Function words of Class A in the list are marked with the rule feature [+M] and those of Class B with [-M]. Any Class A function word is potentially qualified to undergo the operation of ARR.

(9) Class A

Determiner	a, an, any, (her), (his), Saint, Sir, some, the, this$_a$, many$_a$
Preposition	at, but, by, for, from, of, to, into, onto, toward(s), till, until
Auxiliary	am, are, be, been, can, could, do, does, has, had, have, is, must, shall, should, was, were, will, would

Class B

Determiner	this$_b$, these, that, those, more, many$_b$, much, each, all, both,

	either, neither, two etc., Bill's etc.
Preposition	after, against, in, off, on, over, round, since, through, under, up, with, about, before, etc.
Auxiliary	dare, did, need, ought

2. Postponing an inquiry into the derivational process of function words, let us take up their ultimate phonetic forms at first. Each of the [+M] function words has two kinds of phonetic forms traditionally termed as "strong forms" and "weak forms." A strong form appears in a position which bears some degree of stress, while a weak form occurs in a position without any recognizable stress at all.[2] Let us compare them below to see if any significant phonetic correspondence lies between them.[3]

(10)	Strong Form	Weak Form	Example
(a)	i:	ɪ	been
	u:	ʊ,	do
	ə:		Sir
	ei		Saint
	ɛə		(their)
	ɔ:		for
	ɪ		will
	e	ə, ø	(them)
	æ		can
	ɒ		from
	ʊ		could
	ʌ		some
(b)	h	ø	have

As the above table shows, there appear only three vowels in the list of weak forms in contrast to various vowels in strong forms. The tense vowel [i:] in the weak form colum corresponds to its lax counterpart [ɪ], [u:] to either [ʊ] or [ə], and the remaining vowels to [ə]. Where [ə] is deletable, which in most cases it is, another weak form is

obtained.

The presence or absence of [h] serves as another index to strong forms vs. weak forms. The consonant is often deleted in front of [ə].[4] Contracted forms of auxiliaries result from h-Elision (together with ə-Elision). Pronouns such as he, his, him, and her also receive its application.

As is clear from the preceding observation, there exist undeniably fixed patterns of phonetic correspondence between strong forms and weak forms. These patterns, in fact, cover a broader range than this. They are also observable between the given segments of any two lexical formatives which have a common base. To take such a derivationally related pair sequence and sequential as an example. When we compare the initial vocalic segments in both words, we may easily extract the familiar [i:]-[ɪ] correspondence. The segment [i:] in sequence is both tense and stressed, while [ɪ] in sequential is at once lax and unstressed. A more complete table of correspondence follows:

(11)	i:	séquence		sequéntial
	u:	compúte		computátion
	ə:	convérse		conversátion
	ei	explāin		explanátion
	ɛə	párent		paréntal
	ɔ:	infórm	ə	information
	ɪ	Cyrīllic		Cýrīl
	e	instruméntal		ínstrument
	æ	sátire		satírical
	ɒ	cónverse		convérse
	ʌ	illústrious		íllustrate
	h	vehícular	ø	véhicle

Since the ə-Elision is not freely applicable, it may be no wonder that there happens to be only one such example, Cyril, on the list. Further instances undergoing its operation are:

(12) repetition, weaken, rental, faithful, humorous

Both the left-side items and the right-side items on the table (11) are the same as regards the cyclical stress assignment rules, but they depart from each other when they enter word-level phonological rules. While the left-side items are affected by the Diphthongization Rule which makes the underlying tense vowels phonetically tense, the Vowel Shift Rule and the Tensing Rule, the right-side items take the application of other rules such as Laxing (with ARR as a primary rule), Vowel Reduction, ə-Elision and h-Elision (as in vehicle). Without any detailed justification, we assume that all the word-level phonological rules except ARR are also applicable to function words without necessitating any substantial change in the formulations originally proposed by Chomsky & Halle (1968). The ARR, however, needs an extension since the rule in the present form (cf. (13)) applies to a vowel which may be followed by other segments within the same (syntactic) word.[5]

(13) Auxiliary Reduction

$$V \rightarrow \begin{bmatrix} -\text{stress} \\ -\text{tense} \end{bmatrix} / \left\{ \begin{array}{l} \langle VC_0 \rangle \left[\begin{array}{l} \alpha\ \overline{\text{stress}} \\ \langle +\text{tense} \rangle \end{array} \right] C_0^1\ (=C_0)\ [\beta \text{stress}] \\ \left[\overline{\text{stress}} \right] \\ [1\ \text{stress}]\ C_0 _ C_0\ [-\text{cons}] \end{array} \right\} [-\text{stress}]_0\ \#$$

Conditions: β = 1, 2, 3, α is weaker than β,
γ is weaker than 2

The rule (13) must be revised so that it can also apply to a vowel which must be followed by other segments either within the same word or across the word boundary. To put it in the concrete, the relevant context to laxen the underlined vowel in "explanation" is the string of segments "nation" which follow it in the same word. On the other hand, in order to laxen the determiner "some," for instance, as in (1a) (but not (1b)) by ARR, we shall have to include as its context segments lying beyond the word boundary; i. e. the noun "tea." The remainder of this paper is devoted to an extension of ARR examining determiners, prepositions, auxiliaries and the complementizer for-to in that order.

3. 1. Let us observe first the stress of a determiner in a simple noun phrase construction.

(14) I'd like $[[[\breve{\text{so}}\text{me}][\text{more}]]_{\text{Det}}[\text{tea}]_{\text{N}}]_{\text{NP}}$

(15) I'd like [[[sŏme][more]] Ø]

(16) I'd like [[[sŏme] Ø] [tea]]

(17) I'd like [[[sóme] Ø] Ø]

The formative some is assigned the first stress in (17), but the minus stress in (14), (15) and (16). The lack of stress in the latter case can be demonstrated by the weak phonetic form [səm] or [sm̩]. The two kinds of stress above are supposed to issue from different internal structures of the noun phrases. While some in (14), (15) and (16) stand

in front of more and tea, the same determiner in (17) does not. The two accompanying formatives more and tea here serve as sister constituents to some in the Noun Phrase. In order to account for this fact, ARR will have to be formulated as (18).

(18) $V \longrightarrow \begin{bmatrix} -\text{stress} \\ -\text{tense} \end{bmatrix} / [X \; [\underline{\quad}_{+M}] \; Y]_A \; (\#) \; [Z]_B$

Conditions: 1. i) B is a sister constituent of A, and (a) B is dominated by Det, or (b) B = N if A = Det.

As may be apparent from the preceding rule schema, it presupposes that the Determiner be a lexical category, and some and more its immediate constituents. From syntactic point of view, the Determiner cannot be regarded as a lexical category since there may appear lower categories such as Article, Quantifier or the Genitive. Phonologically, however, these intermediate categories seem to be unnecessary. Then there will be no substantial loss if we omit them by the following Readjustment Rule I.

(19) The Readjustment Rule I:
Truncate any categories below the node Det.

Let us note here in passing that (18) involves labels A and B. We will refer the ARR such as (18) as "the Labelled ARR" in contrase with "the Label-less ARR" which will be presented later for the sake of comparison.

3. 2. In this section we will make a further revision on (18) so that it may govern prepositions as well. Stress reduction of a preposition is, as with a determiner, conditioned by the presence of its sister constituent. In

the following examples:

(20) a. He came [[frŏm]$_P$ [[Alberta]$_N$]$_{NP}$]$_{PP}$.

b. Where did he come [[frǒm]$_P$ Ø]$_{PP}$?

(21) a. It's [[fŏr][making the cake rise]].

b. What's the powder [[fǒr] Ø]?

While Prepositions in (20a) and (21a) have their sister Noun Phrases after them, those in (20b) and (21b) do not. Such syntactic differences invite variations of stress patterns of Prepositional Phrases. Presumably, then, all we have to do to strengthen ARR will be to put an additional condition on it such as the following:

(22) Condition to (18): 1. i) (c) B = NP if A = P.

3. 3. This section is concerned with the effect of ARR on auxiliaries. As we shall see, in order to widen the territory for which ARR must be responsible, it will need a further revision. Under the node Aux in surface structure are categories keeping the same position as in the deep structure and grammatical constants which were moved to that position by transformational rules. The former include Tense, the Modal, the Perfect, the Progressive and the Passive, and the latter do, the NEG (later spelled out as not) and the Complementizer to. Regardless of the heterogeneous sources they behave alike as regards ARR.

(23) a. They [hăve been]$_{Aux}$[[waiting]$_V$ for a bus]$_{VP}$.

b. They [hǎve Ø] Ø .

(24) a. I [hăve not][[seen] you for weeks].

b. I [hăve not] Ø .

(25) a. It [hăs Ø][[fallen] on the floor].

b. It [hás Ø] Ø .

As was indicated by the stress marks on the auxiliaries in question, all formatives except those in (23b) and (25b), which are unique predicative elements in respective sentences, result from the operation of ARR. They precede either another formative in the Auxiliary node or the associated verb. The formative including the segment which is affected by ARR and the contextual formative must hold the relationship "B is a sister constituent of A," and the formative in question and the associated verb must maintain such a relationship as "C is a sister constituent of A, and B is directly dominated by C.[6]

The negative particle, which offers an appropriate context to a genuine auxiliary in case of the application of ARR, may either stand by itself (cf. (26a)) or be attached to the preceding formative (often after it was contracted) (cf. (26b)).

(26) a. You [mŭst not] park the car here.

b. You [mústn't] park the car here.

(26a) would not need a further explanation since it is a parallel example to the previously discussed (24a). The newly derived compound formative in (26b) is not subject to ARR for the sole reason that it incluses the negative element as its component. From this we can conclude that

for the free operation of ARR the negative particle may appear separately within the Aux, but must not constitute a part of the formative in question.

The sequence Aux-Aux (let Aux stand for a formative dominated by the node Aux) or Aux-V is often interrupted by a variable such as Adverb (cf. (27) and (28)) or Adverb plus any other elements (cf. (29)).

(27) I hăve never drunk hemlock.

(28) They hăve long been waiting for a bus.

(29) Hăve you ever drunk hemlock?

These intervening elements should be omitted from consideration since they function as neutral contexts as to the applicability of ARR. Their presence or absence do not alter the stress contour on the auxiliary.

As has been implied in the course of the discussion so far, suppose conditions on (18) are broadened by omitting the specification of the relation of the contextual formative to the auxiliary under consideration, a wrong result would occur. Instead of the expected stressed forms as in (30b) and (31b), which are immune from the operation of ARR, we would inevitably have to admit reduced forms produced by the unfavourable application of ARR.

(30) a. $[[$I wĭll drive a car$]_{S_2}]_{S_0}$ $[$if I căn drive a car$]_{S_1}$

b. [[I wíll Ø][if I cán Ø].

(31) a. [[I w̆ill drive a car]$_{S_2}$]$_{S_0}$ [and I m̆ust drive a car]$_{S_1}$.

b. [[I wíll Ø][and I múst Ø]].

We would be able to get rid of this unfortunate situation if we put, among others, a constraint which reads as: The contextual formative under the node Aux is a sister constituent to the formative which undergoes ARR.

Before we proceed to make a final revision of ARR incorporating all the phonological facts we have observed so far, let us note here that the node Aux has been treated as a lexical category analogous to the node Det. From the syntactic representation of the phrase structure such as (32):

(32) They [[have]$_{Modal}$ [been]$_{Progressive}$]$_{Aux}$ ...

we dropped the specification of the intermediate categories the Modal and the Progressive. The position we are maintaining admits two kinds of surface structures: the syntactic surface structure and the phonological surface structure. The former is the outcome of all the syntactic transformations, whereas the latter is produced by the readjustment rule whose function is to simplify the phrase structure of the former. Here we propose a readjustment rule such as the following.

(33) The Readjustment Rule II:

Truncate any categories below the node Aux.

With the help of the preceding rule, it has now become possible to introduce the final formulation of ARR.

(34) The (Labelled) Auxiliary Reduction

$$V \rightarrow \begin{bmatrix} -\text{stress} \\ -\text{tense} \end{bmatrix} / \; [X \underset{+M}{[\quad]} \; Y]_A (([W]_C)\#)[Z]_B$$

Conditions:

1.i) B is a sister constituent of A, and
  (a) B is dominated by Det or Aux, or
  (b) B = N if A = Det, or
  (c) B = NP if A = P. Or
 ii) B is directly dominated by a node which is a sister constituent of A, and
  (d) B = V if A = Aux

2. C ≠ B

3. Y does not include n't

3. 4. A short remark is in order on destressing of the complementizer for-to as in (35).

(35) It is impossible [[[fŏr][John]$_{NP}$[tŏ]$_{Aux}$[[persuade]$_V$ Mary]$_{VP}$]$_S$]$_{NP}$

The pair of constants for-to is one of the markers which indicate the nounness of a given phrase or clause in which they appear. If we are permitted to provide the first half of the complementizers for with the category Preposition, then subsequent stress reduction process will become automatic. The application of ARR is constrained in the same way as genuine prepositions: if a Preposition obeys a sister Noun Phrase ARR works on it. The constant to, on the other hand, has been brought into the Aux node as a substitute for the grammatical formative Tense by the time ARR applies. Hence, it is given a status equal to other formatives under the same Aux. The stress on the vowel in to will be reduced when the item cooccurs with another item of the Aux or a Verb directly dominated by a category which, in turn, is a sister to the formative (cf. (36a)), but it

will not if the necessary conditions are not met (cf. (36b).

(36) a. I'd like [tŏ]$_{Aux}$ [[take]$_{V}$ a break]$_{VP}$

b. I'd like [tó]$_{Aux}$ Ø .

The identical underlying form is realized as two distinct phonetic shapes: one as a strong form [tu:] as in (36b), and the other as a weak form [tə] as in (36a). It may be of some interest that from a phonological point of view the complementizer for is equated with the preposition for, and the complementizer to with an auxiliary.

4. So far we have left the question unanswered whether other formulations of ARR are also possible. We have chosen the original ARR proposed by Chomsky & Halle in The Sound Pattern of English as a competing formulation. In the following discussion we will compare their ARR (or their modified ARR to be more precise) which does not include any categories in its formulation (i. e. the Labelless ARR) and ours which does include them (i. e. the Labelled ARR). In anticipating our conclusion, the Labelless ARR is weaker in descriptive power and includes some unbearable adhocness of explanation which the Labelled ARR has not.

Within the framework of Chomsky & Halle (1968), ARR, as well as other word-level phonological rules, is applied to a phonological "word," that is, a string limited on both sides by two boundaries. Prior to the phonological rules readjustment rules are ordered which simplify some parts of

the syntactic surface structure to make a succession of (phonological) "words." For example, according to Chomsky & Halle, one of these rules segmentalizes (37) into three "words," namely, (38a, b, c).[7]

(37) $[_S\#[_{NP}\#[_D$the$]_D[_N\#$book$\#]_N\#]_{NP}[_{VP}\#$was$[_{PP}\#[_P$in$]_P[_{NP}\#[_D$an$]_D[_A\#$un$[_A\#$likely$\#]_A\#]_A[_N\#$place$\#]_N\#]_{NP}\#]_{PP}\#]_{VP}\#]_S$

(38) a. #the#book#

b. #was#in#an#un#likely#

c. #place#

One thing to note here is that a phonological word does not always coincide with a syntactic word (in other words, lexical formative): they may be identical as in (38c) or the former may be a longer stretch of sounds than the latter as in (38a) and (38b). Chomsky & Halle (1968) asserts, among other things, that in (38b), for instance, the copula <u>was</u>, the preposition <u>in</u> and the determiner <u>an</u> each form parts of the "word" as proclitics to the major lexical category Adjective. Although no remarks were to be found in their book how to deal with auxiliaries in the phonological component of English grammar, it will be a possible natural extension of their contention to treat it as a proclitic to the accompanying major lexical formative such as a verb, a noun or an adjective. Hence, to take an example, (39) will be divided into two words: i. e. (40a) and (40b).

(39) $[\#[\#[\#$he$\#]_N\#]_{NP}$[must have been]$_{Aux}[\#[\#$fired$\#]_V\#]_{VP}\#]_S$

(40) a. #he#

b. #must have been#fired#

In the framework of Chomsky & Halle (1968), no word-level phonological rules can be applied directly to a sequence structured as (41) (to repeat a part of (39)).

(41) [must have been]$_{Aux}$[#[#fired#]$_{V}$#]$_{VP}$#]$_{S}$

Rather, they work on the string (40b), which has had its internal labelled brackets erased one by one by the last rule of each cycle. Since syntactic information is no longer available, it will become impossible to maintain our conditions 1 i), ii) and 2 of ARR in (34), if we follow Chomsky & Halle (1968). In order for the original ARR (cf. (13)) to derive correct stress contour on auxiliaries in (40b) above, the second case of (13) will be applied first to the auxiliary been, which includes the last stressed vowel before the word boundary, then to the immediately preceding formative have, and lastly to must. As far as examples such as (40b) are concerned both Chomsky & Halle's Label-less ARR (13) and our Labelled ARR (34) can bring the same results. However, the former fails to block the application in such a case as (42), where there occur no other predicative elements.

(42) ###you##must#

The rule (13), then, must be constrained more thoroughly so that it may not apply to a function word which is the single formative in a "word." After some revisions it will take the form as (43).

(43) The (Label-less) Auxiliary Reduction

$$V \rightarrow \begin{bmatrix} -\text{stress} \\ -\text{tense} \end{bmatrix} / \#\# \; X \; [\underline{\quad}_{+M}] \; Y \; (\#) \; Z \; \#\#$$

Conditions: 1. $Z \neq 0$
2. Y does not include n't

The rule (43) by far excells (34) in its simplicity, and we must frankly admit that there are a considerable number of cases explicable by it. However, its serious defects will become prominent when we add the following sentences. (We will omit irrelevant specifications and let an underline stand for a "word.")

(44) a. $[[\underline{\text{Hăve}}]_{\text{Aux}}[[\underline{\text{you}}]]_{\text{NP}}[[\underline{\text{drunk}}]_{\text{V}} \; \underline{\text{hemlock}}]]$

b. $[(\text{Oh},) \; [\underline{\text{háve}}]_{\text{Aux}}[[\underline{\text{you}}]]_{\text{NP}}]$

The correct degree of stress can be brought on the auxiliary have by both (43) and (34) but in different ways. By (43) the vowel in have above is at once destressed and laxened mainly because the auxiliary including it is accompanied by another formative, whereas by (34) it undergoes the same process because the auxiliary has the associated verb behind it with permissible optional element between them. Such a sentence as (44b) lies beyond the descriptive power of (43). Since the "word" have you in (44b) is exactly the same as that in (44a), there will be no reasonable way to block the application in the former case and to admit the application in the latter. In contrast, the rule (34) succeeds in stopping its application to (44b) because the necessary condition on the associated verb has not been satisfied.

The inadequacy of the Label-less ARR (43) will be confirmed by another set of examples.

(45) a. (Has it rained since last month?)
[(Yes,) [[it]][hás]$_{Aux}$[[several times]$_{Adv}$]$_{VP}$]

b. (Are they still waiting for a bus?)
[(Yes,) [[they]][áre]$_{Aux}$[[patiently]$_{Adv}$]$_{VP}$]

c. (Must I leave now?)
[(Yes,) [[you]][múst]$_{Aux}$[[as soon as possible]$_{Adv}$]$_{VP}$]

Let us limit our observation to auxiliaries or to those "words" including them. The rule (43) is incorrectly operated on these auxiliaries because none appeared alone in each "word," while our rule (34) is not because none has a verb holding a special relation with the formative.

Now that the deficiencies of the Label-less ARR (43) have been clarified, we will have a stronger motivation to replace it by the Labelled ARR (34). In connection with the validity of the two proposed rules, the adhoc nature of the "word" in Chomsky & Halle (1968) seems to deserve some consideration. We may concede that a phonological "word" need not necessarily coincide with a syntactic constituent of one kind or another. However, we cannot but doubt its reality when we find that, in fact, in many cases it has no verifiable phonetic correlates associated with it. For, if a "word" is a real phonological unit it must possibly form a tone group of some size, and the boundary of any two "words" must potentially be characterized by a pause. It is totally impossible, however, to insert a

pause between the "words" was in an unlikely and place in (37). Conversely, it would be very hard to do without a pause (or an intonation break) between the auxiliary and the adverbial element in each of the sentences (45a, b and c) even if theoretically they may be supposed to belong to the same "word." All of these facts together make the phonological "word" look artificial.

Finally, we may rightly conclude that the Labelled ARR (34) is the only correct formulation of the rule accessible at present. The last problem which has been left untouched is how to keep the labelled brackets undeleted till the derivation of a particular string of segments proceeds to the application of ARR. In Chomsky & Halle (1968) the innermost paired brackets are erased by the last rule in each cycle. So, at the time when ARR begins to operate, such categories are no longer available. We need not take their line of explanation as the only possible way to specify the new domain (or cycle) of the rule. We can achieve the same effect by putting some marks on the labelled brackets when the operations of all the rules in a cycle are over instead of erasing the brackets. This solution will permit us to make use of syntactic structures at any step of phonological derivation keeping the principle of the cyclical application of some phonological rules intact.

5. The following is a summary of the observations which

were made in the preceding sections:

i) Function words such as determiners, prepositions, auxiliaries and the complementizer for-to must receive the operation of some stress assignment rule.

ii) Function words are classified into two groups: the Class A function words undergo a series of stress weakening rules, whereas those of Class B do not.

iii) Each of the Class A function words has one strong form and one or more weak forms. These two kinds of phonetic forms result ultimately from the application or nonapplication of ARR.

iv) In order to make ARR applicable to function words, the second case of the Label-less ARR (13) originally proposed in Chomsky & Halle (1968) must be revised in such a form as (34) so that it can be operated on a string which may or may not include a word boundary in its context.

v) Unlike other word-level phonological rules, ARR is sensitive to syntactic structures of the segments on which it works as well as phonological environments.

It should be noted that the Labelled ARR (34) is dependent on syntactic structures more than any other phonological rules we know. Of course, in Chomsky & Halle (1968) we have already encountered similar rules making use of category names such as Noun, Verb, Adjective and Noun Phrase for the purpose of marking the domain of each rule. But our rule (34) depends more heavily on syntactic configurations. It has to specify not only grammatical

categories of (at least two) formatives containing a segment which may be affected by the rule and the one including contextual segments but also syntactic relations between the formatives. Further investigation is needed on the influence of the Labelled ARR on the whole system of English phonology and to determine in a broader perspective what kinds of syntactic information are funally to be incorporated in the formulation of phonological rules of the language.

NOTES

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1. A few notes on the list (9):

i) Although her and his here belong to determiners, we do not deal with them directly because they are also pronouns and our primary concern is not about prepositions.

ii) Examples of $\underline{\text{this}}_a$ (cf. (a)) and $\underline{\text{this}}_b$ (cf. (b)):
(a) Let's meet this afternoon.
(b) Look at this flower.

iii) Examples of $\underline{\text{many}}_a$ (cf. (c)) and $\underline{\text{many}}_b$ (cf. (d)):
(c) How many brothers have you?
(d) He speaks many languages fluently.

2. The definition of the strong form and the weak form can be changed according tc the total number of stresses. Consequently, a theory which distinguishes only three degrees, i. e. the primary, secondary and weak, may allow a strong form to occur even in a position bearing a weak stress. As an example observe the following:

> Weak forms occur only in unstressed positions; strong forms are used chiefly when the word is stressed, but they also occur in unstressed positions.
> (Jones (1960) p. 126)

In order to uncover a deeper relationship between the

strong or weak form and stress, we will reserve the term "weak form" for a phonetic shape of a formative which has had its vocalic segment reduced to minus-stress, and "a strong form" for a shape which is stressed in the broadest sense.

3. We will exclude the parenthesized items from consideration.

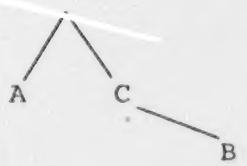
4. Judging from the fact that although we really have weak forms such as [həv] and [əv] we have not *[hv], the application of the h-Elision seems to be ordered before the ə-Elision.

5. The rule (13) was quoted from Chomsky & Halle (1968) p. 240.

6. The following diagrams (i) and (ii) respectively show the hierarchical structural relationships "B is a sister constituent of A" and "C is a sister constituent of A, and B is directly dominated by C."

(i)

(ii)



7. The following (37) and (38) were cited from Chomsky & Halle (1968) p. 368.

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